REMARKS

The Final Office Action mailed August 8, 2008, has been received and reviewed. Claims 1 through 4 and 8 are currently pending in the application. Claims 1 through 4 and 8 stand rejected. Applicants have amended claim 1, and respectfully request reconsideration of the application as proposed to be amended herein.

35 U.S.C. § 102(b) Anticipation Rejections

Anticipation Rejection Based on U.S. Patent No. 6,319,317 to Takamori

Claims 1 through 3 and 8 stand rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 6,319,317 to Takamori (hereafter "Takamori"). Applicant respectfully traverses this rejection, as hereinafter set forth.

A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference. *Verdegaal Brothers v. Union Oil Co. of California*, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). The identical invention must be shown in as complete detail as is contained in the claim. *Richardson v. Suzuki Motor Co.*, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989).

Applicant submits that Takamori does not and cannot anticipate under 35 U.S.C. § 102 the presently claimed invention of independent claim 1, and claims 2-3 and 8 depending therefrom, because Takamori does not describe, either expressly or inherently, each and every element of independent claim 1, as amended herein.

Takamori discloses a structure of a resist coating unit (COT). *Takamori* col. 7, line 15. The COT contains a spin chuck 52, which is rotationally driven and is capable of securing to it a wafer W. *Id.* at col. 7, lines 22-24. A resist solution supply nozzle 86 is also provided for supplying a resist solution onto the front face of the wafer W. *Id.* at col. 7, lines 43-45. Directly above the wafer W is a detection sensor 105 for "detecting a spreading state of an outline of the outer periphery of the resist solution when the resist solution is discharged onto almost the center of the rotated wafer W and the resist solution spreads out from almost the center of the wafer W toward the outer edge." *Id.* at col. 8, lines 29-35. An example of this detecting sensor 105 is a CCD camera. *Id.* at col. 8, lines 35-37.

Amended independent claim 1 is drawn to a system for selectively depositing a material

on a workpiece that comprises in part, "a sensing system configured to measure over the semiconductor die substantially simultaneously both a level of an upper surface of the workpiece and a surface level of a material previously deposited thereon, the sensing system further configured to continuously directly measure in a dimension substantially orthogonal to the platform a surface level during material deposition of the material on the upper surface according to direct measurements in the dimension substantially orthogonal to the platform until the surface level of the material is directly measured to be the specific thickness."

It is respectfully asserted that Takamori does not expressly or inherently describe a sensing system *configured* to *substantially simultaneously* measure over the semiconductor die *both* a level of an upper surface of the workpiece *and* a surface level of a material previously deposited thereon. Rather, Takamori describes a sensor configured to measure the outer periphery of the resist. It appears to the Applicant that Takamori lacks any description of measuring *either* an upper surface of a workpiece *or* a surface level of a material deposited thereon, let alone measuring an upper surface of a workpiece *and* a surface level of a material deposited thereon substantially simultaneously.

Further, while the detecting sensor of Takamori is configured to measure the outer periphery of the resist it is not configured to measure "a dimension substantially orthogonal to the platform" as recited in claim 1 because of the inherent limitation of a camera being capable only of creating a two-dimensional image (x and y dimensions). At best, Takamori's capturing of an image above the substrate results in *measurements* in the x and y dimensions and not in a z-dimension, a dimension orthogonal to the platform. Takamori does not disclose a 3-dimesional camera nor a z-directional analysis of an x and y dimension image.

The Examiner asserts that Takamori can measure a dimension substantially orthogonal to the platform because "the measurement in Takamori are *taken* in a dimension substantially orthogonal to the platform (the sensor is positioned and aim in a straight line above the substrate)" (emphasis added) however, the Applicant respectfully asserts that the Examiner has misrepresented the limitation in claim 1. *Outstanding Office Action* at p. 7. Claim 1 clearly states that the sensing system continuously and directly *measures in a dimension that is substantially orthogonal* to the platform, rather then the detecting sensor being positioned to take measurements from a location that is orthogonal to the platform as the Examiner suggests. By

simply placing the detecting sensor 105 of Takamori in a position orthogonal to the platform does not allow the detecting sensor, or camera, to take measurements in the orthogonal dimension.

The Examiner further states that, "Takamori is considered to be directly measuring, which is considered to be an intended use step that Takamori is considered capable of performing." *Id.* The Applicant respectfully asserts that the sensing system is not only capable of directly measuring but is capable of "directly measur[ing] is a dimension substantially orthogonal," as recited in claim 1. Therefore, although the camera in Takamori may be configured to directly measure, it cannot be configured to directly measure in a dimension substantially orthogonal to the platform because of the inherent limitations of a camera as explained above.

As the description of Takamori is limited to a detecting sensor, such as a CCD camera (col. 8, lines 35-37) which is only capable of creating an image in the x and y dimensions, Takamori does not expressly or inherently describe a sensing system configured to continuously directly measure a surface level in a dimension substantially orthogonal to the platform. Therefore, Takamori does not anticipate each and every element of amended independent claim 1 as would be required to maintain the 35 U.S.C. § 102(b) rejections of this claims.

Claims 2, 3, and 8 are each allowable, among other reasons, for depending directly or indirectly from independent claim 1, which is allowable.

35 U.S.C. § 103(a) Obviousness Rejections

Obviousness Rejection Based on U.S. Patent No. 6,319,317 to Takamori and U.S. Patent No. 6,270,579 to Subramanian et al.

Claims 1 through 3, and 8 stand alternatively rejected under 35 U.S.C. § 103(a) as being unpatentable over Takamori (U.S. Patent No. 6,319,317) and Subramanian et al. (hereafter "Subramanian) (U.S. Patent No. 6,270,579). Applicants respectfully traverse this rejection, as hereinafter set forth.

To establish a *prima facie* case of obviousness the prior art reference (or references when combined) **must teach or suggest all the claim limitations**. *In re Royka*, 490 F.2d 981, 985 (CCPA 1974); *see also* MPEP § 2143.03. Additionally, the Examiner must determine whether

there is "an apparent reason to combine the known elements in the fashion claimed by the patent at issue." *KSR Int'l Co. v. Teleflex Inc.*, 127 S. Ct. 1727, 1740-1741, 167 L.Ed.2d 705, 75 USLW 4289, 82 U.S.P.Q.2d 1385 (2007). Further, rejections on obviousness grounds "cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness." *Id* at 1741, quoting *In re Kahn*, 441, F.3d 977, 988 (Fed. Cir. 2006). Finally, to establish a *prima facie* case of obviousness there must be a reasonable expectation of success. *In re Merck & Co., Inc.*, 800 F.2d 1091, 1097 (Fed. Cir. 1986). Furthermore, the reason that would have prompted the combination and the reasonable expectation of success must be found in the prior art, common knowledge, or the nature of the problem itself, and not based on the Applicant's disclosure. *DyStar Textilfarben GmbH & Co. Deutschland KG v. C. H. Patrick Co.*, 464 F.3d 1356, 1367 (Fed. Cir. 2006); MPEP § 2144. Underlying the obvious determination is the fact that statutorily prohibited hindsight cannot be used. *KSR*, 127 S.Ct. at 1742; *DyStar*, 464 F.3d at 1367.

The 35 U.S.C. § 103(a) obviousness rejections of claims 1 through 3 and 8 are improper because the elements for a *prima facie* case of obviousness are not met. Applicant respectfully asserts that neither Takamori nor Subramanian, either individually or in combination, teach or suggest Applicant's invention as presently claimed in independent claim 1, as proposed to be amended herein.

The teaching of Takamori are summarized above.

Subramanian teaches a method for the application of a uniform layer of developer material on a photoresist material layer. *Subramanian* abstract. A test wafer 52 with the photoresist material layer 50 is rotated on a rotating chuck 54. *Id.* at col. 9, lines 8-11. A nozzle 40 is moved over the center of the photoresist material layer 50 and moves along a predetermined two dimensional path while applying developer. *Id.* at col. 9, lines 13-17. The motor is then stopped and waits a predetermined amount of time until the developing of the photoresist material layer 50 is complete. *Id.* at col. 9, lines 18-22. The remaining developer is spun off. *Id.* at col. 9, lines 22-23. In the alternative, the remaining developer could be rinsed off with water or another solution. *Id.* at col. 9, lines 24-26. After the photoresist material layer 50 is completed, a measuring system 72 measures the thickness of the layer at various locations on the wafer 52. *Id.* at col. 9, lines 27-29. A "processor 64 compares the measured thickness

uniformity with the desired thickness uniformity and determines whether or not the proper thickness uniformity has been achieved within predefined tolerances." *Id.* at col. 9, lines 30-33.

Amended independent claim 1 is drawn to a system for selectively depositing a material on a workpiece that comprises in part, "a sensing system configured to substantially simultaneously measure over the semiconductor die both a level of an upper surface of the workpiece and a surface level of a material previously deposited thereon, the sensing system further configured to continuously directly measure in a dimension substantially orthogonal to the platform a surface level during material deposition of the material on the upper surface according to direct measurements in the dimension substantially orthogonal to the platform until the surface level of the material is directly measured to be the specific thickness."

With respect to the subject matter recited in independent claim 1, it is respectfully submitted that neither Takamori nor Subramanian, taken either together or separately, teaches or suggests a sensing system *configured* to *substantially simultaneously* measure over the semiconductor die *both* a level of an upper surface of the workpiece *and* a surface level of a material previously deposited thereon. Rather, Takamori describes a sensor configured to measure the outer periphery of the resist. It appears to the Applicant that Takamori lacks any description of measuring *either* an upper surface of a workpiece *or* a surface level of a material deposited thereon, let alone measuring an upper surface of a workpiece *and* a surface level of a material deposited thereon substantially simultaneously. The teachings of Subramanian fail to remedy this deficiency. Rather, it appears to the Applicant that the teachings of Subramanian are limited to measuring only a thickness of a material layer 50 after formation of the material layer 50 is complete.

Moreover, it is respectfully submitted that neither Takamori or Subramanian, taken either together or separately, teaches or suggests continuously and directly measuring in a dimension substantially orthogonal to the platform during material deposition of the material. Rather, Takamori only teaches that a camera is positioned orthogonal to a platform. Subramanian does not cure the deficiencies of Takamori with respect to the subject matter recited in amended independent claim 1, as Subramanian also provides no teaching or suggestions that a sensing system *continuously* directly measures in a dimension substantially orthogonal to the platform during material deposition of the material. It is very clear that Subramanian teaches *measuring*

material that has ceased to be deposited as the material being measured is "developed" (i.e., hardened). *See Subramanian,* col. 9, lines 26-36.

The Examiner asserts that "Subramanian discloses further details of a sensor that monitors the surface and spreading state of a dispense." *Outstanding Office Action* at p. 5. Applicant respectfully asserts that Subramanian makes no mention of measuring the spreading state of a dispense and only discloses measuring the thickness of a layer after the material is developed. *See Subramanian* at col. 6, lines 60-64, col. 9, lines 26-36, col. 10, lines 18-32. The Examiner further asserts that the "sensor directly measures a surface level of the material being deposited on the upper surface until the surface level of the material is directly measured to be a specific thickness of the material." *Outstanding Office Action* at pg. 5. However, Applicant respectfully asserts that Subramanian does not teach of measuring a material while it is being deposited, rather Subramanian teaches that the layer's thickness is measured *after the layer is complete. See Subramanian* at col. 6, lines 60-64, col. 9, lines 26-36, col. 10, lines 18-32. Subramanian further teaches that the path values, volume values, or volume flow can be adjusted for *the next wafer* to achieve the optimal thickness and not that the optimal thickness is achieved by measuring the thickness throughout the application of a material. *Id.* at col. 9, lines 33-35, col. 9 line 66- col. 10 line 3, col. 10, lines 27-32.

Clearly Subramanian, like Takamori as argued above, also fails to teach or suggest Applicant's claim element of a "sensing system further configured to continuously directly *measure in a dimension substantially orthogonal to the platform a surface level during material deposition of the material*...until the surface level of the material is directly measured to be a specific thickness of the material," as recited in Applicant's amended independent claim 1.

Regarding Examiner assertion that "it would have been obvious to one of ordinary skill at the time of the invention," Applicant respectfully asserts that any proposed combination would destroy the cited reference for its intended purpose. *Outstanding Office Action* at pg. 5. Specifically, Takamori teaches of monitoring distribution of resist on a rotating wafer using analysis techniques in the X and Y dimensions. *See Takamori* col. 8, lines 30-36, col. 9, lines 44-52.

Clearly, the substitution of Subramanian's sensor system that teaches to "*measure[] the thickness of the developed photoresist material layer* 50 on the wafer 52" (*Subramanian*, col. 9,

lines 26-27) (emphasis added) in a z-dimension into Takamori with its all-encompassing teaching of calculations in the x and y dimensions, unquestionably destroys Takamori for its intended purpose of "*detecting* a spreading state of *an outline of the outer periphery* of the resist solution" (emphasis added). *Takamori* col. 8, lines 31-32. Therefore, since the alleged combination changes the principle operation of the primary reference and additionally renders the reference inoperable for its intended purpose, the combination is improper. (M.P.E.P. 2143.01). Accordingly, Applicant respectfully requests the rejections be withdrawn.

As neither Takamori nor Subramanian teaches or suggests Applicant's claimed invention including a "a sensing system configured to *substantially simultaneously* measure over the semiconductor die *both* a level of an upper surface of the workpiece and a surface level of a material previously deposited thereon, the sensing system further configured to *continuously directly measure in a dimension substantially orthogonal to the platform a surface level during material deposition of the material* on the upper surface according to direct measurements in the dimension substantially orthogonal to the platform *until the surface level of the material is directly measured to be a specific thickness of the material*", it is respectfully submitted that the teachings and suggestions of Takamori and Subramanian do not support a *prima facie* case of obviousness against independent claim 1. As such, under 35 U.S.C. § 103(a), the subject matter to which independent claim 1 is directed is allowable over the teachings of Takamori and Subramanian.

Claims 2, 3, and 8 are each allowable, among other reasons, for depending directly or indirectly from independent claim 1, which is allowable.

Obviousness Rejection Based on U.S. Patent No. 6,319,317 to Takamori or Takamori and U.S. Patent No. 6,270,579 to Subramanian et al., and Further in View of U.S. Patent No. 6,642,155 to Whitman et al.

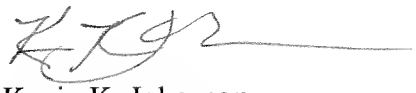
Claim 4 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Takamori (U.S. Patent No. 6,319,317), or Takamori and Subramanian et al. (U.S. Patent No. 6,270,579), as applied to claims 1 through 3 and 8 above, and further in view of Whitman et al. (U.S. Patent No. 6,642,155). Applicants respectfully traverse this rejection, as hereinafter set forth.

Claim 4 is allowable, among other reasons, for depending indirectly from independent claim 1, which is allowable.

CONCLUSION

It is respectfully submitted that each of claims 1 through 4 and 8 is allowable. An early notice of the allowability of each of these claims is respectfully solicited, as is an indication that the above-references application has been passed for issuance. If any issues preventing allowance of the above-references application remain which might be resoled by way of a telephone conference, the Office is kindly invited to contact the undersigned attorney.

Respectfully submitted,



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